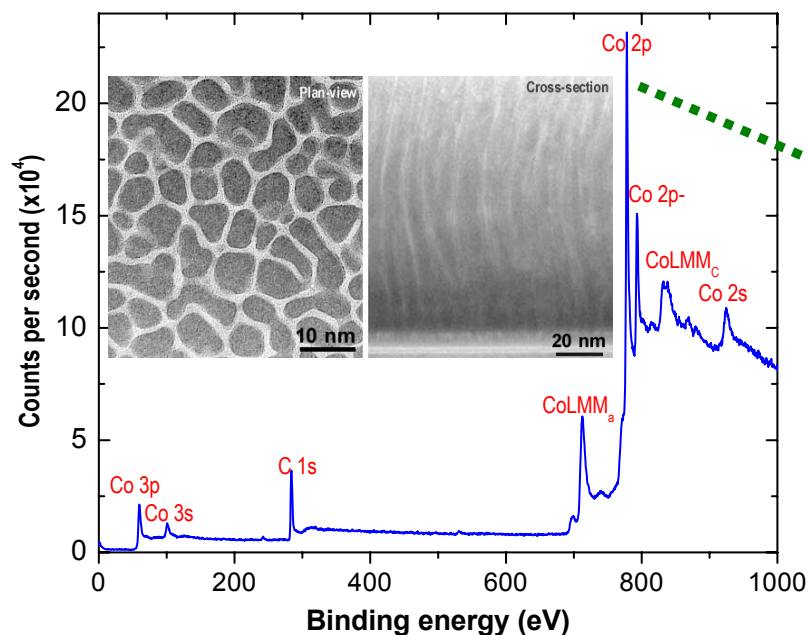


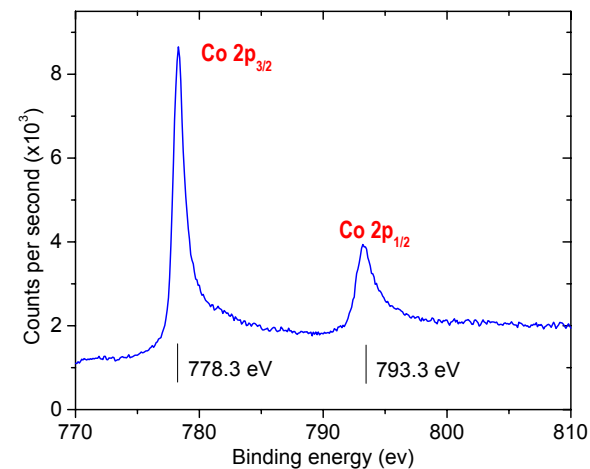
LSU's X-ray Photoelectron and Auger Electron Spectroscopy

Efstathios I. Meletis MRI-DMR 0116757

Self-assembled Co-nanorods in diamondlike carbon (DLC) thin films. We recently observed self-assembling of Co-nanorods in DLC¹. The films show excellent tribological and mechanical properties while the Co-nanorods can provide desirable magnetic properties. DLC encapsulation of Co-nanorods can weaken the exchange coupling between the magnetic domains and significantly reduce media noise. The DLC environment also provides biocompatibility and prevents Co oxidation which is a major drawback of 'wet' techniques for synthesizing Co nanoparticles. Such **multifunctional nanocomposite thin films** provide a promising solution for small-scale devices (micro- and nano-electronics, MEMS, NEMS, sensors, etc.).



XPS survey spectrum of Co/DLC nanocomposite thin films showing absence of oxygen (insets are plan-view and cross-sectional TEM micrographs of the film).



High-resolution spectrum of Co 2p peak showing presence of Co in the metallic state.

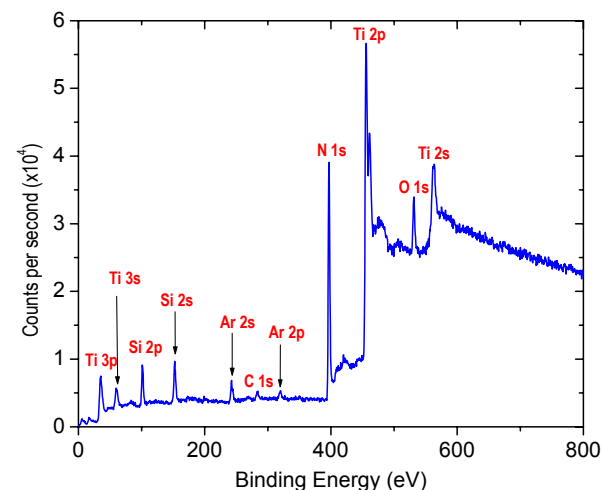
1. Wang, Jiang, Meletis, *Appl. Phys. Lett.* Sept. 2003 (in print).

LSU-MCC X-ray Photoelectron and Auger Electron Spectroscopy

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Education & Research

High performance multi-technique surface analysis. Material science and engineering is selected as a core cluster for the *Louisiana Information Technology* initiative that is aimed at driving economic development throughout the state. **Education and infrastructure** development are two key components in that endeavor. The addition of the XPS/Auger surface analysis system to the **LSU-MCC** (**Materials Characterization Center**, <http://mcc.lsu.edu>) has contributed to the strengthening of MCC and provided new opportunities for education (see below) and research.



Dr. Jiang “surrounded” by the ME7723 Materials Characterization class (Spring semester 2003) while explaining Auger spectra characteristics in a plasma nitrided titanium alloy. A research project utilizing surface analysis is conducted by each student in the class.

XPS spectrum from a Ti-Si-N nano-composite coating obtained by Wei Wang as part of her class project.